

19 European Patent Office

12 European patent disclosure

11 EP 0 795 356 B1

45 Publication date and disclosure of notice regarding the patent issuing:
May 26th 1999, patent information sheet 1999/21

51 Int Cl.⁶: **B05B 15/04**

21 Application number: 96103788.4

22 Filing date: March 3rd 1996

84 Named treaty countries: AT BE CH DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

43 Date of disclosure: September 17th 1997 patent information sheet 1997/98

73 Patent holder: VOSSCHEMIE GmbH
D-25436 Uetersen (DE)

72 Inventor: Voss, Klaus-Wilhelm
25436 Uetersen (DE)

74 Agent: Richter, Werdermann & Gerbaulet
Neuer Wall 10
20354 Hamburg (DE)

56 Objections: EP-A-0 384 626
WO-A-90/15668
DE-A-4 106 960
US-A-5 413 637
EP-A-0 669 197
WO-A-95/21700
GB-A-2 223 425

Remark: Within nine months after the disclosure of the information of issuing of the European patent anybody may protest against the European patent at the European Patent Office. The protest has to be filed in written form and has to be justified. It counts as filed after the objection fee has been paid. (Art 99(1) European Patent treaty).

Description

[0001] The invention concerns a sealing- and masking stripe according to the main term (Oberbegriff) of patent claim 1.

[0002] Sealing- and masking strips are used during painting of cars or car parts, preferably in the area of doors and tailgates, where the sealing and masking strips are supposed to prevent the penetration of paint or paint mist into the door crevices.

[0003] For that situation various cross section profiles for sealing and masking strips are known.

[0004] Angular or round sealing and masking strips exist which have an adhesive layer for fixing to the object one is working at. Such strips are also offered in the form of a joint, which is simple and practical to handle or package, respectively. In that case several strips are sidewise connected to each other, while the joint is either continuous or also made in sections.

[0005] In the case of the sealing and masking strips it is of disadvantage, that the paint application occurs onto the sealing and masking strips, and therefore adjacent to the adhesive layer, so that the solvent of the paint attacks the adhesive layer. This results in a hardening of the adhesive and the adhering paint. The following unevenness of the paint- and adhesive films after removal of the strips can only be eliminated by the painter under significant time- and work efforts. Since such sealing and masking strips are commonly made of foam, foam residues remain at the hardened adhesive after peeling off the strips, which causes additional problems during preparation of a perfect painting job.

[0006] Also, the drying of the paint in drying chambers at about 80°C contributes significantly to the hardening of the (partially dissolved) adhesive which is covered with paint. Additionally, in the case of round sealing and masking strips, the problem exists that it is almost impossible to position them so exactly that the adhesive layer almost completely lays on the object. Therefore, in practice, significant adhesive regions exist, which may join with the paint and harden.

[0007] From WO 90/15668 a method and a device are known which shall prevent the paint mist from wetting certain surfaces, which belong to an object to be painted, whereby that surface is located in a different level than the object surface to be painted, and that it could be reached from such paint spray mist after passage through a gap. The passage of paint spray mist in such a gap, e.g. a gap between two body parts of a car is avoided by applying a flexible sealing stripe into that gap, which fills the gap completely, whereby such sealing stripe is mounted in the gap region by means of an adhesive layer or made in place. That sealing stripe shows an L-shaped cross section profile, where one side is coated with an adhesive on the outside, where the inner transition of the wall section between the two ends of the sides is pulled bow-shaped towards the inside by forming a channel-like section. The arrangement of sealing strips in a gap between a movable body part, e.g. a door, and a non-movable part occurs in such a way that the sealing stripe is mounted with the side having the adhesive applied to it, to the vertical side of the non-moving part of the gap to be sealed, which requires that such a vertical wall section exists, at which the mounting of the sealing stripe is possible. In cases where this mounting surface does not exist, such sealing strips can not be used, i.e. this means, for all of the cases for which an undercut of the body part occurs. During closing of the movable body part the sealing stripe deforms and seals the gap.

[0008] A device for the temporary bridging of the body gaps, especially during paint jobs, is known from DE-A-41 06 960. This device for preventing the penetration/entry of abrasive material or paint particles during the corresponding treatment of body parts consists of a sealing stripe with a cross section with a triangular full-profile made of a soft foam polymer with an adhesive coating on at least one of the three sides, where one of the legs of the cross-section profile shaped almost like a right-angled triangle is equipped with a back-swinging area, while the outside jumping leg area is equipped with this adhesive. Towards one wall on the inside, this cross section profile shows an arch-shaped retraction under formation of a fillet-like (channel-like) section. During use, the sealing strip closes the gap between the wedge shaped body parts. The position of the adhesive coating at one of the three external walls of the triangular sealing stripe requires that the external wall region of a car body part forms sidewise, a closable gap limited at

the side by an enclosure and fastening area for the sealing strip. The mounting of the sealing stripe in the area of undercut body parts is not possible.

[0009] There exist also cover strips, which prevent by means of a side lip, that the paint or its solvent, respectively, come in contact with the adhesive. Since hereby a clear boundary exists between the new paint layer and the old one, the newly painted area spray mist occurs in the edge areas, which also has to be removed in a time-consuming process.

[0010] It is therefore the task of the invention to create a sealing and

[0011] masking stripe of the initially mentioned type, which guarantees a perfect boundary between the area to be painted and the existing painted areas of an object, preferably in the area of the doors and the tailgate of a car, so that no time-consuming after-finishing of the transitional areas is necessary.

[0012] This task is solved by the characteristics of claim 1.

[0013] The sealing and masking strips show preferably on both sides of the adhesive stripe a lip and a fillet*, while the cross section is symmetrical or can also be asymmetrical by different dimensioning of the lips and/or fillets.

[0014] In case of the asymmetrical design a wider application range is given.

[0015] The lip and also the fillet are designed in such a way, that during correct positioning according to the application, the lip can not lay on the vertical surface to be painted.

[0016] The basic shape or the cross section, respectively, of the sealing and masking strips is derived from a square.

[0017] The lips formed on both sides of the square subdivide the sealing and masking tape preferably into a first region, which is about $2/3$, and a second region, which is about $1/3$ of the cross section.

[0018] The first region has preferably rounded edges, so that also a nearly circular region can be formed. The second region carries the adhesive, which is applied along the longitudinal axis, where, caused by the fillets on both sides, the width in this second region can be smaller than in the first region.

* *Hohlkehle* also translated as 'channel'

[0019] For building the adhesive layer, preferably an adhesive is used that adheres by simple pressure application, preferably so-called dispersion-adhesive.

[0020] The foam used is preferably an open-pored soft foam (soft foam with open porosity) made of polyurethane with a volume weight of 20 – 30 kg/m³, but also other foams, such as polyurethane, polyester, polystyrene, PVC, polyethylene, polyisocyanate, polyphenol and silicon foams can be used.

[0021] The sealing and masking strips according to this invention are preferably sold in combination, whereby the parallel running sealing and masking strips are partially connected with the lip, which obtains its final and advantageous form by ripping it off the neighboring sealing and masking strips.

[0022] The joint is formed by the manufacturing of a two-dimensional foam-cushion, either by sawing or milling. Thereby corresponding cuts which are located opposite to each other are shaped into the foam block, so that the two cuts are located opposite to each other and are only separated by a small tear-bridge, whereby the tear bridge consists of two still to be separated lips made of two adjacent sealing and masking strips.

[0023] In contrast to the manufacturing of a joint by cold-welding no material densification occurs, so that easy tearing, and therefore separation of the single sealing and masking strips from each other can occur. The separation event occurs automatically at the thinnest position of the tear-bridge and is therefore concentric.

[0024] The important inventive advantage consists in the use of the lip as a contact bridge. The finished sealing and masking strip can be applied in such a way that the contact bridge gets in contact with a preferably bent region, located next to the sealing and masking strip, and in this way prevents direct contact between sprayed paint and the adhesive. A contact between paint and adhesive leads to an undesired edge formation, since this mixture normally hardens significantly and is difficult to remove.

[0025] If the sealing and masking strip is applied incorrectly, i.e. that the lip does not serve as the contact bridge, the formation of a hardened paint edge is effectively hindered by the circumstance that the lip, in relation to the fillet, prevents a contact of the paint with the adhesive.

[0026] Further advantageous designs are marked in the sub claims.

[0027] Following the invention is explained further with the example of drawings. It shows

Fig. 1 the joint sealing and masking strip in cross section

Fig. 2 a second design of the joint sealing and masking strip in cross section

Fig. 3 a third design of the joint sealing and masking strip in cross section

Fig. 4 a fourth design of the joint sealing and masking strip in cross section

Fig. 5 the cross section of a sealing and masking strip mounted into a car door gap.

[0028] Figs. 1 to 4 show different designs for joint sealing and masking strips 100, 200, 300, 400 according to the invention.

[0029] The design according to Fig. 1 shows for the individual/separate seal- and masking stripe 100 a cross section profile 10 derived from a rectangle. The main body 16 is subdivided into two ranges 17, 18 by lips 13, 14, located on opposite sides 11, 12, which form a peel bridge 15 between two seal- and masking strips 100. The first region 17 covers about 2/3 of the cross section profile 10, and the second region 1/3. In the first region 17 the edges 19, 20 are rounded, as well as the transition to the lips 13, 14. In the second region 18 the adhesive layer 21 is located concentrically between lips 13, 14, whereby in each case a fillet 22, 23 is formed between the adhesive layer and the lips 13, 14. The width B1 of the adhesive layer 21 is smaller than the width B2 of the first segment 17.

[0030] The sealing and masking strips 200, 300, 400 show a different design of the first region 17. The first region 17 of the design in Fig. 2 is almost circular shaped, while the design according to Fig. 3 shows conical flank sides 24, 25 running to a taper, and a vaulted/arched upper side 26 and the design according to Fig. 4 shows parallel running flank sides 27, 28, an upper side 28a running perpendicular and chamfered* edges 29, 30.

[0031] The formation of the fillets 22, 23 is the same for the designs according to Figs. 2 and 3 as for the sealing and masking strip 100 according to Fig. 1.

[0032] The sealing and masking strips 400 according to Fig. 4 show a diagonal/beveled region 31, 32 in stead of a fillet.

* abgeschrägt – chamfered or beveled

[0033] In designs according to Fig. 2, 3, and 4 the lips 13, 14 or the adequate tearing bridge 15, respectively, are shorter than according to Fig. 1.

[0034] Fig. 5 shows a sealing and masking strip 100 according to the invention, which is located in a car door gap 33 of a vehicle not shown. The sealing and masking strip 100 is fixed with its adhesive layer 21 to the door frame 34 in such a way that one of its lips 13 is in contact with an arched area segment of the door from 34 which is adjacent to the adhesive layer 35 of the vehicle, so that paint penetrating the car door gap does not get to the adhesive layer 21. The door 36 of the car strike the first region 17 of the sealing and masking strip 100, whereby here the pressure onto the adjoining door 36 is sufficient for sealing. The applied paint 37 in the area of the sealing and masking strip 100 is soaked up by the open pored foam, so that no excessive paint accumulation occurs in the corners 38, 39.

Reference sign list:

[0035]

sealing and masking strips	100, 200, 300, 400
cross section profile	10
side	11, 12
lip	13, 14
tear bridge	15
base member	16
region	17, 18
edge/corner	19, 20
adhesive layer	21
fillet	22, 23
width	B1, B2
flanks	24, 25
upper side	26
flanks	27, 28
upper side	28a
corner	29, 30

region	31, 32
car door gap	33
door frame	34
adhesive region	35
door	36
applied paint	37
corner	38, 39

Patent claims

- 1 Sealing and masking strips (100; 200; 300; 400) for temporarily masking automobile body gaps, more particularly in paint-spraying operations, of a base member (16), whose surface area, within a subarea along the strip longitudinal axis, is provided with an adhesive layer (21), in which case, on the base member (16) a lip is formed which, via a concave-like region, passes into the base member section carrying the adhesive layer (21), characterized in that the base member (16), adjacent to the adhesive layer (21), possesses two lips (13, 14) proceeding obliquely relative to the longitudinal direction of the base member which, via concave regions (18), pass into the base member section carrying the adhesive layer (21), in which case the reciprocally adjacent concave regions (18) of two base members (16) complement each other so as to form a channel (22, 23) located between two adhesive layers (21).

- 2 Sealing and masking strip according to claim 1, characterized in that the sealing and masking strip (100; 200; 300; 400) is provided on both sides of the adhesive strip (21) with a lip (13, 14) each as well as with a groove (22, 23).

- 3 Sealing and masking strip according to either claim 1 or claim 2, characterized in that, in lieu of a groove between the lips (13, 14) and the adhesive layer (21) an obliquely area (31, 32) is formed.

- 4 Sealing and masking strip according to either claim 1 or claim 2, characterized in that, in lieu of a groove between the lips (13, 14) and the adhesive layer (21), any configured, obliquely proceeding area is formed.
- 5 Sealing and masking strip according to any of claims 2 to 4, characterized in that, the lips (13, 14) are disposed on the base member (16) in such a way that the same is symmetrical.
- 6 Sealing and masking strip according to any of claims 2 to 4, characterized in that, the lips (13, 14) are disposed on the base member (16) in such a way that the same is asymmetrical.
- 7 Sealing and masking strip according to any of claims 1 to 6, characterized in that, the lip or lips (13, 14) subdivide the base member (16) concentrically or eccentrically, in which case the lips may be directed towards the top side (26, 28a) or towards the adhesive layer (21) and, in the asymmetrical disposition of the lips (15, 14), these can be aligned differently concentrically or eccentrically.
- 8 Sealing and masking strip according to any of claims 1 to 7, characterized in that the base member (16), by means of the lip or lips (13, 14), is subdivided into a first area (17) and a second area (18), which carries the adhesive layer (21), in which case the first area (17) has sides (11, 12) proceeding at right angles to the top side (26, 28a) or tapering conical flanks (27, 28) as sides or possesses a semicircular or approximately semicircular configuration.
- 9 Sealing and masking strip according to claim 8 or claim 9, characterized in that the top side (16, 28a) is convex in the outward direction.
- 10 Sealing and masking strip according to either claim 8 or claim 9, characterized in that the corners (19, 20) are rounded off adjacent to the top side (26, 28a).

- 11** Sealing and masking strip according to either claim 8 or claim 9, characterized in that the corners are bevelled off adjacent to the top side (26, 28a).
- 12** Sealing and masking strip according to any of claims 1 - 11, characterized in that the lips (13, 14) are shorter than the distance from the adhesive layer (21) to the separating line of the first and second area (17, 18).
- 13** Sealing and masking strip according to any of claims 1 - 12, characterized in that the lips (13, 14) of the first area (17) are rounded off.
- 14** Sealing and masking strip according to any of claims 1 - 13, characterized in that the lips (13, 14) are angularly disposed on the base member (16).
- 15** Sealing and masking strip according to any of claims 1 - 14, characterized in that the sealing and masking strip (100; 200; 300; 400) is comprised of soft cellular material.
- 16** Sealing and masking strip according to claim 15, characterized in that the soft cellular material possesses an open-cell structure.
- 17** Sealing and masking strip according to either claim 14 or claim 5, characterized in that the soft cellular material is comprised of polyurethane, polyester, polystyrene, PVC, polyethylene, polyisocyanate, polyphenol or silicone.
- 18** Sealing and masking strip according to any of claims 1 - 17, characterized in that the sealing and masking strip (100; 200; 300; 400) is laterally connected with further sealing and masking strips (100; 200; 300; 400) across the lips (13, 14) so as to form a composite construction, in which case the sealing and masking strips (100; 200; 300; 400) of a composite construction are able to correspond to different embodiments.

- 19** Sealing and masking strip (100; 200; 300; 400) according to any of claims 1 - 17, characterized in that the sealing and masking strip (100; 200; 300; 400) is cut, sawn and/or milled from the respective material or is fabricated in the form of a single strand.

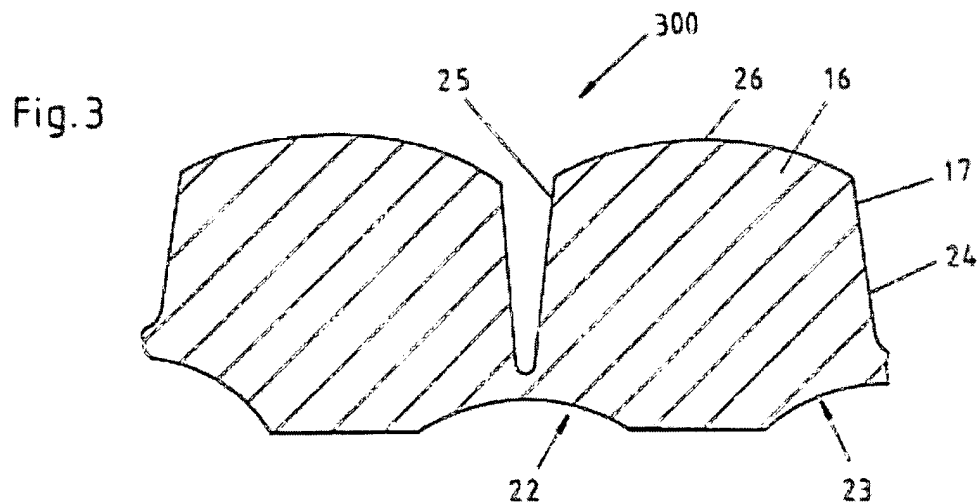
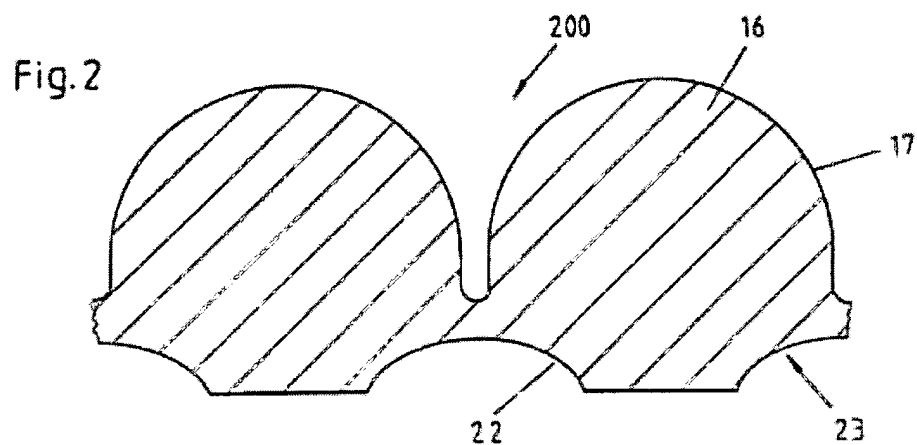
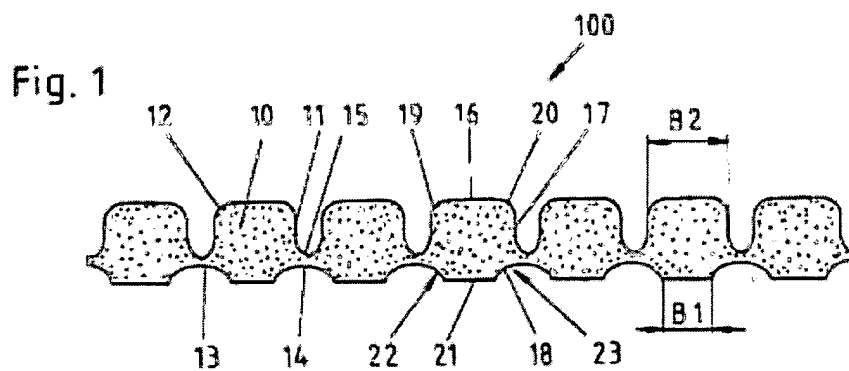


Fig. 4

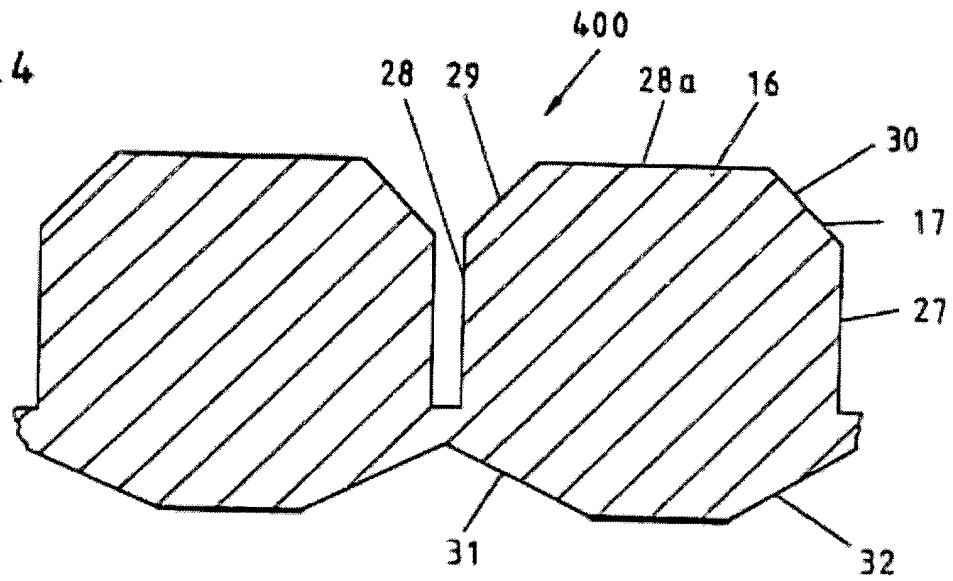


Fig. 5

